TECHNOLOGY DEPT.

December 23, 1950

15¢

SCIENCE NEWS LETTER

In This Issue—SCIENCE REVIEW OF THE YEAR

DEC 27 1950
DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Celestial Fireworks

See Page 403

A SCIENCE SERVICE PUBLICATION

$5.50 A YEAR

VOL. 58 NO. 26 PAGES 401-416

DETROIT PUBLIC LIBRARY
TECHNOLOGY DEPT.

MEDICINE

Cause of Roseola Found

"Baby measles," formerly thought by some to be not a disease at all but allergic reaction, is transmitted by virus and probably carried by adult.

➤ SCIENTISTS finally have determined the cause of roseola, or "baby measles," a common disease of infants which scares the daylights out of parents but is actually not very serious.

Physicians at the University of California School of Medicine have evidence that the disease is caused by a virus, and for the first time they have achieved its transmission in animal experimentation.

Until now a large segment of the medical profession, particularly in Europe, has maintained that roseola was not really a disease. It was maintained that the rash accompanying the disease, which is also known as exanthema subitum (surprise rash), was an allergic reaction.

What frightens parents is the three-day fever, with a temperature commonly as high as 105 degrees. When the temperature drops and the disease seems about over, out pops the rash, resembling measles, which lasts just one day usually. After the one-day rash the disease is terminated. The disease occurs in nearly all children sometime between the ages of six months and two years.

What have fascinated scientists, aside from the infectious agent responsible, are mysterious circumstances which have created doubt that roseola is actually a disease.

Chief among these is how children acquire the disease. It occurs frequently among children who are most carefully guarded against exposure to sick children or adults. Moreover, there is serious question about the possibility of transmitting it from an infant with the disease to a healthy infant.

The California scientists conclude that the most likely source of the infection is the healthy adult. They speculate that the virus is something like herpes simplex, a common infection which causes fever blisters. Like herpes, roseola virus may be present at all times in the oral passages of the adult, even though it may not cause disease in the carrier. They are now trying to isolate the virus from throat washings of adults.

In determining the nature of the disease agent, the scientists took blood serum from a diseased infant. Then they passed this through a filter which catches all infectious agents larger than viruses. When the filtered residue was injected into monkeys it reproduced the disease over and over again.

The research was reported in PEDIATRICS (Oct.) by Drs. C. Henry Kempe, Edward B. Shaw, Henry K. Silver, and J. R. Jackson, all of the department of pediatrics.

Science News Letter, December 23, 1950

PUBLIC HEALTH

Weapon Against Typhus

New rat killer, warfarin, is successful where 1080 and ANTU have both failed. Can be used in minute proportions. Rats do not become bait-shy.

➤ A POWERFUL weapon against plague and typhus fever has been found in a chemical called warfarin.

The chemical is a rat-killer, but it is "not just another rodenticide," Dr. Wayland J. Hayes, Jr., and Thomas B. Gaines of the U. S. Public Health Service declare after field and laboratory tests.

"Warfarin provides a completely new workable approach to rodent control," the public health scientists state.

Control of rats is important in the fight against typhus fever and plague, since both are spread by rats and rat fleas. Some of the tests in Savannah, Ga., were made in the very place that had been a focus of typhus fever infection and where the role of rat fleas in spreading the disease was discovered.

Both 1080 and ANTU, two warborn rat killers, had been used in these places with only partial success. Warfarin was successful in controlling rats in these places even when used in amounts as small as five-thousandths percent of the amount of yellow cornmeal used as bait.

Important advantage of warfarin is that rats and mice do not get bait-shy. The chemical is a slow-acting poison, but the rodents will go on eating it on bait until they die. They die without exciting the suspicion of other rodents, so that the poison continues to be effective for rat control.

Cats and maybe dogs might get poisoned from eating poisoned rats.

Although highly poisonous when taken in repeated doses, the scientists do not seem to think the hazard to humans from warfarin bait would be great. Bait stations and bait cups were nevertheless used in their trials whenever there was any chance that a domestic animal or child or other irresponsible person might get at the bait. There seems no reason why people generally as well as pest control specialists should not learn to use warfarin successfully, the scientists state.

Warfarin, discovered by Dr. Karl Paul Link and associates of the University of Wisconsin, is related to dicumarol, anti-blood clotting chemical used to prevent blood clots in veins. It acts by checking formation in the blood of prothrombin, chemical important for normal clotting of blood, and by causing damage to small blood vessels. It causes internal hemorrhages in poisoned rats and the animals apparently die of shock. Warfarin gets its name from the initial letters of the Wisconsin Alumni Research Foundation which holds the patents. Details of the trials of it in Savannah are reported in Public Health Reports.

Science News Letter, December 23, 1950

PSYCHOLOGY

Emergency Proclamation Good for Morale

➤ LEADING psychologists and psychiatrists agree with high government officials in believing that the proclamation by President Truman of a national emergency will have good psychological effect on the people.

"However," Dr. Gordon W. Allport told Science Service, "the proclamation should be followed up. It is only the first step. Next the government should tell the people what they can do about the situation." Dr. Allport is professor of psychology at Harvard.

President-elect Leo H. Bartemeier of the American Psychiatric Association told Science Service that "the people know the situation is bad, but the proclamation should help to unite the people and to make them realize how tremendous the problem is."

"We know from experience in the last war," Dr. Allport declared, "that bad news increases morale."

American people know how to face up to reverses, he said, but they need to know specifically what they can do to overcome those reverses if their morale is to remain unshaken.

In Dr. Bartemeier's opinion, the American people are facing up to the international crisis very well indeed. They are much more realistic this time than they were during the last war, he declared. He sees an absence of hysteria now.

As to what the government can do to keep up this good morale, Dr. Bartemeier said he thinks the various departments are already doing a good job. He pointed particularly to the activities on behalf of Civil Defense by the several state governments.

Science News Letter, December 23, 1950

GENERAL SCIENCE

NeedNewMagneticTheory

Carnegie Institution of Washington reports year's advances in this field and also in biology, heredity, obstetrics and other branches of science.

See Front Cover

➤ BEFORE scientists can solve the puzzle of the main magnetic field of the earth and account for it, it may be necessary to revise the basic theories regarding magnetism itself, Dr. Vannevar Bush, president of the Carnegie Institution of Washington, hints in his annual report.

In the stars, Dr. Bush explained, magnetic fields have been found by the Carnegie Institution astronomer, Dr. Horace W. Babcock, which "perform evolutions which would be quite unbelievable if the evidence were not well supported."

In the study of the magnetism of rocks in the earth, Dr. Bush reported that evidence seems to have been found for a transient local reversal of the magnetic field, perhaps arising from localized electric current deep inside the earth.

These localized currents, deep in the earth, seem to be the cause of the variations of the way the compass points year by year.

Rocks were found several years ago by Carnegie scientists that were magnetized with the south-seeking pole pointing downward as though they were laid down in the southern hemisphere, although they were found in the Appalachians of eastern United States and were of Silurian age, about 210 million years old. It is now believed that there was no gigantic major shift of land mass. Instead electrical currents in the earth's depths overpowered and reversed the general magnetic field of the earth. Now reversals of the compass do not occur, but there are violent deviations of the compass in a pattern which slowly moves westward over the surface of the earth.

Inversion Point Not Constant

Dr. Bush reported as an important discovery of the year the fact that the point that the common mineral, quartz, changes from one crystalline form to another, called the inversion point, is not a constant of nature, as long supposed. Careful measurements on about 300 specimens show that the inversion temperature varies from sample to sample, a fact that is expected to have important implications in geology.

The speed of earthquake waves in the upper six to 12 miles of the earth's crust is higher than previously supposed, Dr. Bush reported, bringing the natural vibrations into line with the travel of waves from explosions.

Nearer to Plant's Secret

Plant biologists on the Carnegie staff are getting closer to the secrets of photosynthesis, particularly the chemical part of the reaction by which light is converted into chemical energy. There is evidence that components in the mechanism other than chlorophyll are necessary, and these are formed more slowly in the plant than chlorophyll.

Fundamental studies upon the bearer of heredity, the chromosomes, show that some of the changes of mutations in the genetic inheritance of living things, in the case of the experiments on corn, are due to minute pieces of the chromosomes moving from one position to another. When such a piece gets next to a gene, controlling some characteristics, its normal action is inhibited.

Hale Telescope

The Hale telescope has been busy during its first year in operation, making a small but memorable beginning on its broad program designed to extend our knowledge of the large-scale structures of the universe. One of the delightful by-products of this work with the 200-inch telescope is a series of exquisite photographs bringing out details of the heavens never before seen.

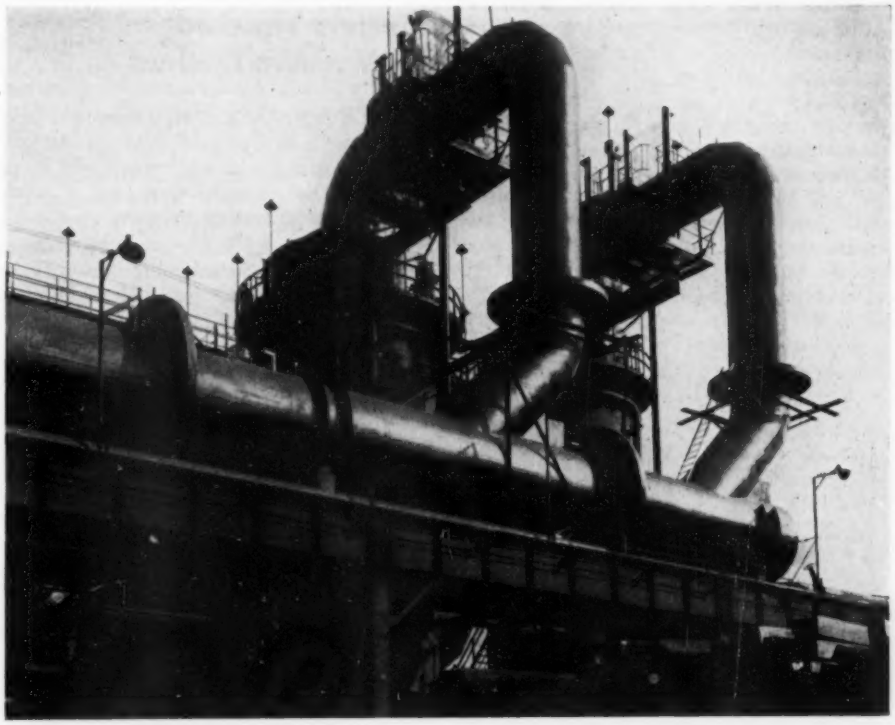
The spiral nebula NGC 628, shown on the cover of this week's SCIENCE NEWS LETTER, is in the constellation of Pisces, the fishes. One of the brighter and larger spirals, it is about five million light years away. Measurements of its velocity show it to be moving away from the earth at a speed of approximately 300 miles per second.

Sex Reversal Accomplished

Sex reversal has been accomplished for the first time in a mammal, through the work of Dr. R. H. Burns of the Carnegie Department of Embryology. It was produced in the opossum gonad by treatment of pouch young with the female sex hormone estrogen.

A practical instrument for use of obstetricians was produced as a by-product of a physiological research by Dr. S. R. M. Reynolds. Called the multichannel tokodynamometer, it records the contractions of all parts of the human uterus in childbirth. Normal patterns of contractions can be distinguished from abnormal types that do not permit smooth and properly timed passage of the infant.

Science News Letter, December 23, 1950



SMOKE WASHERS—Smoke stacks are made smokeless at the National Works of U. S. Steel's National Tube Company where gas from the blast furnaces goes through these gas washers in which dirt is removed by a multiple water spray. Then electrostatic precipitators further reduce the dust content of the gas.

MEDICINE

Betatron Used for Cancer

"Encouraging responses" were noted when 33 patients in late stages with extensive cancers were treated with 24,000,000-volt atom smasher.

➤ "ENCOURAGING responses" in the treatment of 33 cancer patients with a 24 million volt betatron were reported by Drs. Roger A. Harvey, Lewis L. Haas and John S. Laughlin of the University of Illinois College of Medicine at the meeting of the Radiological Society of North America in Chicago.

Because these patients were all in late stages of the disease with extensive cancers, the "ultimate salvage rate" is not expected to be very high. But from the experience with this group of patients, the doctors believe that wider application of the betatron is justified.

The extreme penetration and distribution of intensity of the X-ray beam from this machine require special attention in treatment planning, the doctors pointed out. They feel that better results could be had from conventional X-ray treatments by adopting some of the features of preparation of the patient for betatron treatments.

Because rather large amounts of normal tissue are unavoidably exposed to the X-ray beam when one so penetrating as the 24 million volt betatron X-ray beam is used, the doctors were particularly interested in possible secondary complications. So far, however, there has been a minimal amount of radiation sickness. Patients have not had any significant changes in their blood. Skin reactions were greater on the side where the beam exits from the body than on the entrance side, but have been "remarkably mild" and have not caused much discomfort to the patients.

The betatron, the doctors stated, is "not a substitute for early diagnosis and prompt treatment of cancer."

Patients with severe and intractable heart disease may benefit from another kind of radiation treatment, namely large doses of radioactive iodine, it appears from good results reported by Drs. Richard H. Chamberlain, Charles C. Wolferth, Jack Edeiken and John J. Meade of the University of Pennsylvania.

Out of a group of 66 patients given this treatment, 39 have now been followed long enough for preliminary evaluation of the results, the Pennsylvania doctors stated. Best results were obtained by those with severe angina pectoris. Most of these showed marked improvement. Those with severe congestive heart failure did not get as much benefit, although 27% experienced good relief and another 27% fair relief. How long the good effect will last is not yet known.

Science News Letter, December 23, 1950

INVENTION

Oysters Shucked By Vacuum Method

➤ NO TOOLS or heat are required to open oyster shells in a process on which the government issued a patent recently. It might be called the vacuum way, and it works with clams and other bivalves.

The process utilizes a vacuum chamber into which a considerable quantity of oysters is placed at a time. When the cover is closed and sealed, the air inside is removed by a vacuum pump. In a relatively short time all shells are opened up wide.

Then air is permitted to rush into the chamber. The sudden change in pressure kills the oysters by tearing the shell contracting muscles, thus enabling the meat to be removed easily.

The inventor is John W. Pogany, Port Townsend, Wash. Patent 2,530,783 was awarded to him.

Science News Letter, December 23, 1950

Question Box

ASTRONOMY

What produces interstellar glow? p. 413.

GENERAL SCIENCE

What are the arguments for and against universal service for 18-year-old boys? p. 412.

Why does the way the compass points vary from year to year? p. 403.

GENETICS

How did hybrid corn save European civilization? p. 414.

MEDICINE

What causes "baby measles"? p. 402.

What effect does the betatron have on cancer? p. 404.

PUBLIC HEALTH

What are the advantages of warfarin as a rat killer? p. 402.

Photographs: Cover, Carnegie Institution of Washington; p. 403, U. S. Steel; p. 405, Fairchild Aircraft; p. 406, Mills Observatory, Dundee; p. 407, MIT; p. 408, Argonne National Laboratory; p. 409, USAF Air Materiel Command; p. 410, Carnegie Institution of Washington; p. 411, General Electric; p. 413, Dan Wilkes.

SCIENCE NEWS LETTER
VOL. 58 DECEMBER 23, 1950 No. 26

45,400 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1950, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAte 2-4822.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horovitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Science; Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; L. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: H. L. Smithton, E. W. Scripps Trust; Frank R. Ford, Evansville Press; Charles E. Scripps, Scripps Howard Newspapers.

Officers—President: Harlow Shapley; Vice President and chairman of Executive Committee: Alexander Wetmore; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, A. C. Monahan, Marjorie Van de Water, Martha G. Morrow, Ann Ewing, Wadsworth Likely, Sam Matthews. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

GENERAL SCIENCE

Science Review for 1950

Attempt to make H-bomb, calendar from exploding atoms, start of 30-day weather prediction among top science highlights of year.

This summary of the year's happenings in the world of science is limited by space to just the highlights. Most of the events are described in detail in the pages of SCIENCE NEWS LETTER *for the current year. If you wish to refer to any particular report, you may find it readily through the index. (See SNL, June 24 and also the issue which will appear next week, Dec. 30).*

By SCIENCE SERVICE STAFF

Upon a wide front, science and technology have made significant gains of practical and fundamental importance during 1950. Great telescopes have extracted new facts about the heavens. There is accelerated promise of bigger atomic bombs to come, while atomic science continues to give aid to health and human understanding. Cells and chemicals give new medical promise. Biologists have seized greater control over nature.

There is new progress despite the jar that impending world war gives to non-military research and the diversion of brains and talent to secret weapons and material.

Exploding carbon atoms created in millenia past by cosmic rays have given archaeologists a new atomic calendar with which ancient civilization can be dated.

A billion dollars or so was pledged by America in a secret attempt to make a super-atomic bomb, triggered by the older fission bomb and using the tritium hydrogen isotope as the "explosive."

Predicting officially the weather 30 days in advance for the United States became a regular procedure.

Color television arrived in a flurry of controversy, while better and more widespread transmission for television was forecast by a coated wire channel. And in the single side-band radio transmission there is the possibility of doubling the available radio channels.

In the air, America saw its first turboprop transport and omnirange beams were installed for guiding planes at airports.

In the heavens, it was discovered that Proxima Centauri, star nearest the solar system, shoots out terrific geysers of flaming gases to double its brightness in a few minutes. A great smash of a meteor hitting the earth was discovered as a crater in Quebec. In the Pacific a new major mountain range on the ocean bottom was discovered.

Industry now has a new ceramic that can be cut, threaded or turned on a lathe.

In medicine, as the many kinds of antibiotic "wonder drugs" continued to save human life, any physician can now prescribe the anti-rheumatism drugs, cortisone and ACTH, and they are proving to be useful in a variety of other ills, including severe burns.

A new method of processing human blood allows the utilization of all the scores of its complex chemicals for medical use.

The manpower situation in science and technology became more critical with the nation on the verge of important decisions on how to allocate these human resources.

Science News Letter, December 23, 1950

AERONAUTICS

Develop Self-Start System For Jets and Gas Turbines

An aircraft self-starter system for jet and gas-turbine engines made possible starts without aid from ground power.

Light-weight pulsejet engines mounted at the outer tips of the rotating helicopter blades made possible greater pay-load capacity.

America's first turbo-prop transport, an airliner capable of speed approaching 500 miles an hour and with engine noise and vibration practically eliminated, was made ready for flight.

Many of the proposed 400 omnirange stations, which provide radio range signals in all directions instead of on a four-course range, were commissioned and put into use.

Supersonic speed propellers for subsonic planes were designed and promise higher speeds for conventional airplanes.

Monochlorobromethane, called C-B for short, was recommended as an automatic fire extinguisher gas for airplanes, promising to save many lives.

A Fairchild military plane equipped with detachable box-car-size cargo compartment, with many possible uses, made its maiden flight.

An aircraft direction finder was developed which is attached to the airport radar and activated by VHF signals from a plane in communication, producing a line of light on the radar screen from the pip to the center.

Some 4,380 miles of airways were completely equipped with omniranges which give signals in all directions.

The glide slope signal of the Instrument Landing System was further developed eliminating effect upon it of changing ground levels due to snow, and making its signals uniform regardless of variations in nearby terrain.

Measurement of moisture under runway pavement was made less complicated and expensive through use of radioactive material.

A "quick disconnect" valve for fuel lines was developed to lessen the hazard of fire after crashes.

A new fire-resistant synthetic liquid suitable for use in the hydraulic system of a modern plane was developed and met approval by CAA.

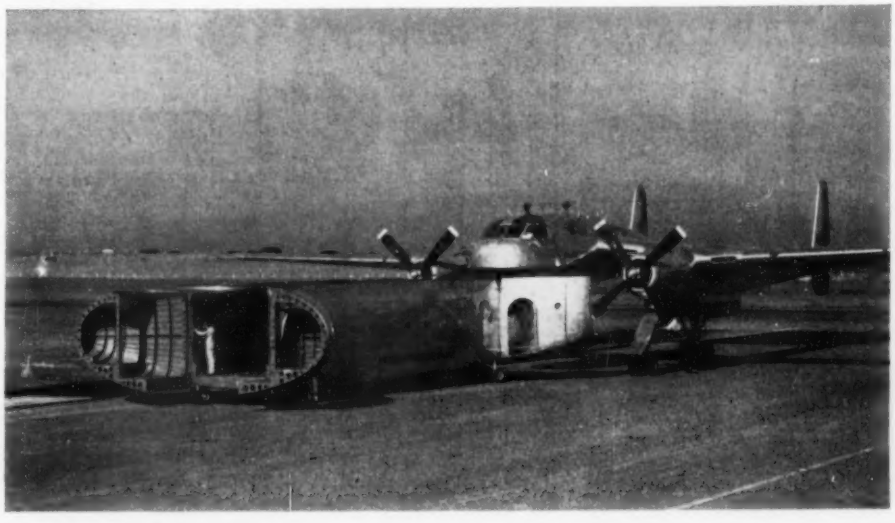
Eight-bladed giant propellers over 19 feet in diameter were developed for use with gas turbine engines.

Rivet-less wing panels for airplanes were constructed by a new forging process that saves cost, time and metal.

Aerodynamic forces at transonic speeds were studied by use of instrument-carrying bomb-like models dropped from altitudes of 35,000 to 40,000 feet and the fall tracked with optical and radar tracking units, slowed with braking devices before hitting the earth.

A device for feathering the propellers of an airplane automatically two seconds after engine failure was developed.

A camera which can take a "picture" of the extremely high pitched part of the noise of a jet plane was described; it makes use of film sensitive to ultra-sound waves.



DETACHABLE—The cargo-carrying fuselage of the Fairchild XC-120 Packplane can be towed from beneath the plane on its own wheels. These wheels are stowed within the "pod" when in flight.

A new type aircraft engine utilizing exhaust gases from a conventional piston power plant to operate a turbine was developed.

Quick take-off was made possible for a light bomber by wings the leading edge of which can be raised or lowered to change attack angle.

The Collier Trophy was awarded to the Radio Technical Commission for Aeronautics for developing the omnirange, VHF system of air navigation and traffic control officially adopted for U. S. use.

Experimental jet-propelled commercial air transports were in flight in Canada and England.

A three-wheel, low-down jeep which carries an electric generator solved the problem of quick starting of engines of jet-propelled airplanes on naval carriers.

A twin-jet fighting plane built in Canada was reported to be the world's most powerful fighter.

A new airplane gas turbine engine of the turbo-prop type was developed which is capable of producing two horsepower per pound of weight.

Aerodynamics problems at hypersonic speeds, five times faster than sound, were studied by firing model from gun into face of supersonic stream of air.

ARCHAEOLOGY

Archaeological Remains Dated by Carbon 14

A method of dating archaeological remains, if they are of organic origin, by measuring the proportion of radioactive carbon 14 remaining was first put to use; it is based on the fact that all organic material less than 25,000 years old contains radioactive carbon and that the radioactivity is lost at a constant rate.

The giant sloth lived in Gypsum Cave, Las Vegas, Nev., about 10,500 years ago, dating of his dung by the radiocarbon calendar showed; presumably man there was contemporaneous since his remains were found in alternate layers with those of the sloth.

The famous paintings by early man in Lascaux cave in the Dordogne, France, were found by the radiocarbon calendar to be about 15,000 years old.

Woven rope sandals from a lava-covered Oregon cave were found by the radiocarbon atomic calendar to be among the oldest articles associated with man in the Americas—9,000 years old.

The world's oldest known village site in Iraq was shown by the radioactive carbon calendar to be about 7,000 years old.

On Jebel Baradost, northeast Iraq, 7,000-year-old pottery was excavated from two caves.

Indians were shown by radioactive carbon dates to have lived in North America long before the present Eskimos; Pre-Indians lived in New York State at least 5,000 years ago.

Various evidences of the Colonial period, including a footprint, a gun-flint, fragments of a clay pipe, a rusty nail, a fragment of glass and two pieces of orange pottery, found in the brown earth beneath the "Viking Tower" of Newport, R. I., showed that it was not built until the 17th Century Colonial period.

Tiny, delicately-worked flakes of stone about the size of a paper clip and known to scientists as "Lamellar" flakes were found in the frozen soil of the Canadian Arctic and link the ancient Dorset people, who were probably the first Eskimos to reach the New World, to men who lived in Asia in Middle Stone Age or New Stone Age days.

More than 1,500 tiny, delicate flint objects were collected on Cape Denbigh, on the most northwesterly extension of the Bering Sea, work of a Stone-Age people who lived there thousands of years ago.

A group of Alaskan people, comprising 3,000 individuals at the beginning of the century, have now been reduced by epidemics to only 40 persons, it was found.

An Indian campsite shown by radioactive carbon to be about 7,000 years old was discovered at the site of the Angostura reservoir, South Dakota.

An alphabet for writing Quechua, ancient language of the Incas still in common use, was devised and agreed upon by experts in the field.

A new painting was discovered among those made by Cro-Magnon Man in the cave at Lascaux, France; it represents a witch-doctor guarding the entrance to a subterranean chamber.

Flint implements of Old Stone Age types, possibly 30,000 years old, were collected on the surface of the desert in northwestern Saudi Arabia.

The first evidence of Stone Age Man was found near Khurrumabad in Luristan, Persia.

A Roman fortress was located near the Wadi Sirhan, northwest Saudi Arabia.

Anthropometric data were obtained for the first time on a series of 150 Bakhtiari tribesmen in southwest Persia.

The first temple from the Akkadian period (2350-2200 B. C.) was discovered in the ancient city of Nippur in Iraq as the earliest of a series of temples built in the course of 1600 years for a paramount god, Enlil.

Record of a murder trial in 1850 B. C., written in cuneiform script on a clay tablet, was unearthed in Iraq on the site of the ancient city of Nippur.

An important mathematical tablet about 4,000 years old was found at Tell Harmal near Baghdad, Iraq.

Discovery of a collection of 48 religious texts on papyrus, written in Coptic, containing apparently the whole body of literature of the Gnostic sect, previously believed completely lost, was announced.

Microfilming was undertaken of more than 500,000 pages of ancient manuscripts in St. Catherine's Monastery at Mt. Sinai; among them discovery was made of what may be the oldest copy of the New Testament in Greek and Syriac on gazelle's hide.

The fragment believed to be bone—only such specimen discovered in the Sutton Hoo ship burial—was found not to be bone at all but a cast of what was originally burned bone, the cast formed by contact of the burned bone with corroding iron under acid soil conditions.

ASTRONOMY

Discover Two More Stars With Giant, Sun-Like Flares

Discovery of flare-ups on two red dwarf stars raised to five the number of stars known to have flares similar to those on the sun, but of such violence as to more than double the star's total brightness within a few minutes; 50 flare-ups within the last quarter century were spotted on Proxima Centauri, star nearest the earth.

Pluto, through observation with the 200-inch telescope, was found to be second smallest planet and only 3,550 miles across.

Chubb meteor crater, larger than any previously known, more than two miles across, was discovered in Quebec, Canada; Australia's half-mile-wide Wolf Creek Crater was dug out by a meteor, analysis of rock fragments showed.

Photographs were successfully made with a two-mirror, Schmidt-type astronomical telescope, first of its type to go into operation.

Number of radio stars known to broadcast the static picked up here on earth with microwave instruments was increased to 50.

Colors and luminosity of near-by stars were determined with highest accuracy, making possible a quick electronic method for determining the distance of certain stars from the earth by studying their apparent brightness and color.

Correction of the distance from the earth to the sun, and of the earth's path through space as well as more accurate calculation of the mass of the planets Mars, Venus, Mercury and earth-moon was made possible through use of a new, more accurate path for the asteroid Eros.

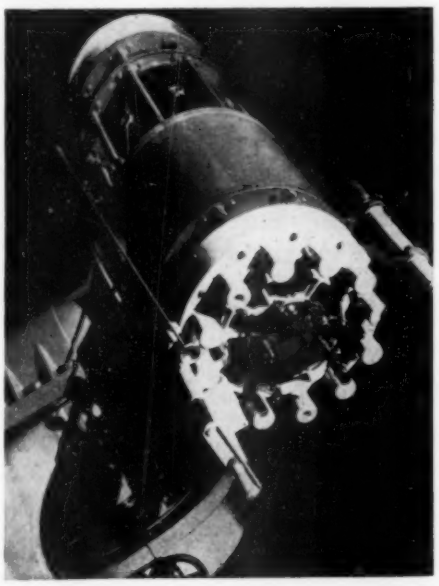
Newly discovered asteroid Icarus on its closest approach to the earth was found to be only one-third as far away as Eros when it comes nearest our planet and thus promised to replace Eros as a yardstick for solar distances.

One new comet, Minkowski, was discovered.

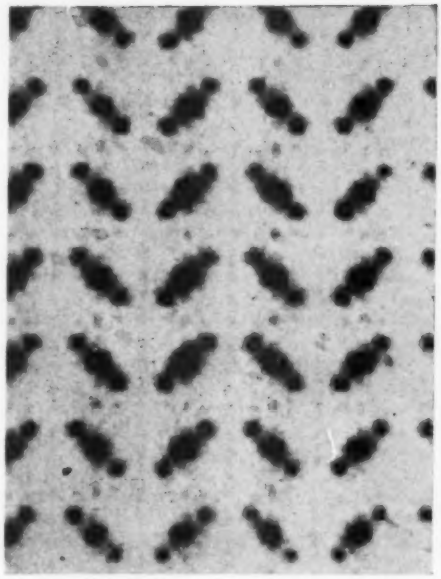
Novae seen to blaze up include one star in the constellation of Lacerta, three in Scorpio, and a fourth outburst of a nova-like star in Aquilae (all these in our own galaxy) plus one in the spiral nebula Messier 83, one in Messier 81 and one in IC 4051.

Two new color filters, one containing artificially grown ammonium dihydrogen phosphate crystals and the other using calcite for the thickest element, were put to use studying the flares, prominences and spots on the sun.

A huge sunspot was associated with serious disruption of international radio communica-



DOUBLE EYE—Not only was this two-mirror, Schmidt-type telescope, first of its kind, completed in the workshop of the University Observatory in St. Andrews during 1950, but successful photographs were taken with it at the Mills Observatory, Dundee, Scotland.



AN ATOM—Each of these dots is an atom, photographed for the first time with a new kind of microscope using both X-rays and ordinary light. The microscope was invented by Dr. Martin J. Buerger, MIT physicist. Photograph shows the structure of pyrite. Iron atoms with 26 electrons each are the darker spots, the fainter ones are sulfur atoms with 16 electrons each. Magnification is about 2,200,000 diameters.

tion Feb. 20 to 24; a severe radio disturbance was experienced Aug. 19 to 20; the radio storm that began July 11 was repeated five times at 27-day intervals and lasted about a week each time, such recurring storms being usual during declining solar activity.

Confirmation through experiment here on earth was obtained of the first step in the atomic transmutations that keep the sun stoked with energy through interaction of carbon, nitrogen and hydrogen.

An artificial star made of a tungsten filament lamp housed in a box, and carried from one mountain peak to another was developed and used as a standard to aid in measuring the distance of real stars.

A tenth planet, far beyond the last discovered planet Pluto and 77 times as far from the sun as is the earth, was predicted on the basis of study of the orbits of comets.

Changes in the period of revolution of 18 double-star-teams was explained as due to the ejection of matter from one of the pair.

A second double star system in which one star has a huge atmosphere that "eclipses" the other star was discovered.

Two great clouds of extra-galactic nebulae were discovered, providing new information about the distribution of "island universes" in space.

Fifteen hundred new galaxies of stars similar to our Milky Way were discovered in a survey of the bowl of the Big Dipper.

A 23-year survey of stars of the ninth magnitude or brighter found within 30 degrees each side of the celestial equator was completed and their proper motions compared with those recorded over half a century ago.

BIOLOGICAL SCIENCES

Find Bacteria Multiply by Dividing, as Human Cells Do

First clear-cut evidence was found that bacteria multiply by the same complex process of dividing, called mitosis, that human cells go through.

Protoplasm was seen in three dimensions for the first time through a new technique for drying specimens without flattening them; the technique involves replacing the water of the specimen with carbon dioxide under high pressure which then evaporates, leaving the specimen uncollapsed.

A substance in plants called phycocyanin was found to be the key to why plants blossom in accordance with the length of daylight and darkness.

Plants were grown with built-in protection against insects. New insecticides travel from the soil into the plant system.

Use of antibiotics instead of high temperatures for the preservation of canned foods was studied.

A four-fold increase in the output of penicillin resulted from a change made in the heredity of the mold.

The cells in the body of some animals do not stop dividing until a couple of hours after the death of the animal, experiments on mice showed.

Radioactive tracers from Oak Ridge enabled scientists to follow, step by step, the growth of a chicken from the egg.

Definite proof was obtained, through experiments on plant seeds, that radiation from an atomic bomb explosion can alter heredity; other experiments demonstrated that radiation damage to the chromosomes can be diminished by absence of oxygen.

The ovary of an old cocker spaniel, transplanted to a young mongrel, enabled the latter to give birth to thoroughbred cocker spaniel puppies.

A new kind of Siamese cat, pale yellow in color with deep orange ears, feet and tail and clear blue eyes, and with very affectionate and gentle disposition, was created by genetics.

New hybrid seed that will do for the sugar beet farmer what hybrid corn did for the corn farmer were developed.

A new hybrid sugar cane especially adapted to mechanical harvesting was developed.

Tomatoes were grown and ripened from a flower detached from the plant and planted in a glass flask containing synthetic food.

By prompt action when blight was discovered in an experimental plot of Victoria oats, a disease resistant variety was bred in time to save the nation's oat crop.

The breeding of opossums in captivity was reported.

A rich new field of pink shrimp was found off the west coast of Florida.

A new vaccine against rabies, immunizing dogs for 18 months, was reported.

Seventy-nine previously unknown types of fish found at Bikini Atoll, site of atom bomb tests, were reported.

Lobsters have a "homing instinct"; they can return to their original feeding grounds when released elsewhere, it was learned in Bermuda.

Turtles and mice exposed to low concentrations of carbon monoxide were shown to be able to oxidize CO to carbon dioxide.

A single Guadalupe fur seal was discovered on an island off Southern California; in Florida, two ivory-billed woodpeckers were found. Both species had been considered extinct. The trumpeter swan appeared to be gaining in numbers. The whooping crane did not.

Forest fires in California were worse than they have been in a quarter of a century.

A large pall of smoke, originating from forest fires in the Canadian Northwest, covered eastern Canada, eastern United States, and northwestern Europe, Sept. 24-30, causing the sun and moon to take on a blue or purple color.

Cotton insects and grasshoppers took the biggest bite of a heavy insect toll which would have been even heavier, except for a cold, late spring over most of the country.

Tracing with Geiger counters the path of a soil-dwelling wireworm tagged with radioactive cobalt promised the development of better insect control; radioactive material attached to bird bands was used to clock the birds' return to the nest.

Two new insect killers—dieldrin, a fly-killer, and aldrin, useful against the boll weevil—went into commercial production.

Antimycin A, relative of streptomycin, was found to be promising as an insecticide.

Two new chemicals effective against mites were announced.

A strain of Scolytus bark beetle, carrier of Dutch elm disease, was found to be DDT-resistant.

Hearings were held to determine what controls are necessary on use of chemicals in fruit and vegetable growing to combat insects, weeds and plant diseases.

A new rat poison which acts by causing internal hemorrhages was introduced and experts predicted that with it and other new raticides the nation's annual loss to rodents could be cut by at least 75%.

Using a synthetic plant hormone, 2,4,5-T, apples were matured as much as 30 days earlier than usual.

The weed-killer 2,4-D sprayed from airplanes was found effective in eradicating sagebrush from southwest pasture land.

A new weed killer, maleic hydrazide, was found to kill pest plants in a cotton field without adverse effect on the cotton.

Another chemical, sodium 2,4-dichlorophenoxy ethyl sulfate, killed weeds in a strawberry bed without harming the strawberries.

Spraying fruit trees with a salt of maleic hydrazide in a weak solution delayed their blossoming, preventing frost damage.

Irradiation for a few seconds with very high frequency radio waves speeded up the germination of garden seeds.

Johnson grass, a Southern weed, was reported to be developing resistance to weedkillers.

Oak wilt, a serious forest disease that cannot yet be controlled, spread from the lake states south into Missouri and Arkansas, and east into Pennsylvania.

For the first time, all 48 states took part in the U. S. Plant Disease Warning Service.

After a three-year, $120,000,000 fight against foot-and-mouth disease in Mexico, American scientists reported there was not a single new case of the plague in 1950.

Artificial cultivation of the virus of foot-and-mouth disease on slices of tissue from tongues of dead cattle was reported; a fast and accurate new test for the virus was developed.

Newcastle disease of poultry was combatted by a new and simple blood test for diagnosis, and by a method of exposing young chickens to air saturated with a weak strain of the virus to immunize them.

Use of radioactive tracers showed that plants absorb food from the soil very rapidly.

Sulfanilamide, found to stop sweet palm juices from fermenting, made it possible to tap palm trees as a source of sugar.

A method for killing typhoid, dysentery and other germs on fresh fruits and vegetables by pasteurization was developed.

Selective breeding to produce plumper cattle resulted in cows with slowed-down thyroid glands, unable to reproduce.

The reality of ice-worms was established when they were observed in the Seward ice field on the Yukon-Alaska boundary.

Ion-exchange treatment with artificial resins produced a milk which makes smoother ice cream.

Concentrated apple juice and grape juice were made possible by new methods of preserving volatile flavor essences.

A new drug, 2-amino-5-nitrothiazole, provided an economical method to prevent blackhead disease in turkeys and chickens.

A plant cell is equipped with a network of strands that carry materials between the nucleus and the surrounding cytoplasm, microscopic study revealed.

Simulated undersea pressures developed in a special stainless steel "bomb" were found to kill bacteria and other microorganisms; at pressures of 200 to 300 atmospheres, bacteria died in a day or two.

Feeding tiny amounts of cobalt in carefully controlled diets speeded up the fattening of hogs.

New, more accurate, analytical techniques showed that plants need from two to 100 times as much sulfur as was formerly believed; soils, particularly in rural areas, show an acute shortage of sulfur.

The bark of the balsam poplar yielded a fungicidal extract.

Production of high grade cellulose from cane sugar by bacterial action was reported.

CHEMISTRY-PHYSICS

Giant Atom Smashers To Probe Nature's Secrets

Several new atom smashers were completed or under construction during the year: among them a new type non-ferromagnetic synchroton employing coils instead of iron-core electromagnet; an electron linear accelerator which in the prototype stage produced 25,000,000 electron volts; a 7,000,000,000 electron volt bevatron; and the world's largest betatron with capacity of 300,000,000 electron volts.

The first non-AEC owned nuclear reactor was approved for research at the Consolidated University of North Carolina.

Dimensions of three types of nuclear reactors were made public by the Atomic Energy Commission.

An X-ray microscope using curved mirror for image enlargement enabled scientists to see internal details of living and non-living matter at magnifications of 100 diameters.

A low-cost table model electron microscope was developed which is capable of magnifications by photography to 50,000 diameters.

Definite evidence was discovered for the existence of a double-weight or duplex neutron called the "dineutron," formed by the bombardment of a triton, heart of hydrogen isotope three, tritium, by another triton; the dineutron lives only a very short time and then becomes two ordinary neutrons.

The neutron is not a fundamental particle of nature, it was discovered; it decays after ten to 30 minutes of freedom into an electron and proton.

Lifetime of one of the fundamental particles within the atom, the pimeson, was determined to be one 60-millionth of a second.

Through forked paths showing on photographs of cosmic rays, two new kinds of mesons were discovered, having extraordinarily short lives, only two ten-billionths of a second.

Cast blocks of emulsion without any glass photographic plates were found useful in photographing the tracks of cosmic rays.

First photographs of cosmic ray collisions 100 miles above the earth were obtained with a V-2 rocket.

The summit of the Swiss Jungfrau mountain was chosen as the site of a cosmic ray observatory for the study of the production of mesons.

Two new elements, heaviest yet known, No. 97 and No. 98, were created in the cyclotron; they were named berkelium and californium.

Americium, element 95, was isolated in silvery metallic form and found to be lighter than expected, only about half the density of its parent plutonium.

Three new light-weight isotopes of neptunium were made by bombarding uranium atoms with deuterium hearts; the new isotopes have atomic weights of 231, 232 and 233.

Tellurium 130, previously believed stable, was found to be radioactive with the extraordinarily long half life of 1.5 sextillion years.

Tritium (triple weight hydrogen) was found in minute amounts in the moisture of the air.

With a new microscope using light in two wavelengths physicists looked at individual atoms for the first time.

Announcement was made by President Truman that research would be pushed on the development of a hydrogen super-bomb.

Heat transfer through helium at temperatures near absolute zero was found to be practically instantaneous, settling an international dispute.

Evidence was discovered that uranium is a superconductor at temperatures near absolute zero, the exact temperature depending on the amount of impurity present.

Magnesium was found, like gold, to have increased electrical resistance at temperatures close to absolute zero.

The gray metal form of tin was added to germanium and silicon as a material that will act as semiconductor.

Prospecting for thorium and uranium by airplane was made possible by a new atmosphere monitor that can measure the radon gas emitted by deposits of these radioactive materials.

New kinds of nuclear radiation detectors, utilizing crystals of potassium bromide which become conductors of electricity when exposed to gamma or X-rays, and sodium iodide activated by a tiny amount of radioactive iodine salt, were announced.

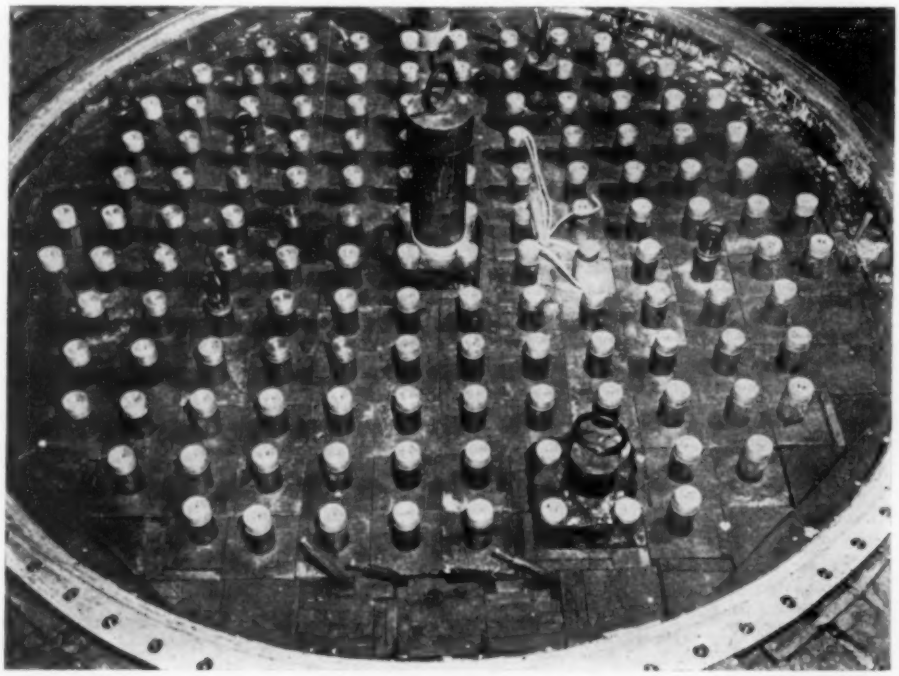
A neutron counter consisting of a detector tube lined with boron was announced.

A universal scintillation counter was developed to count all three kinds of radiation—alpha, beta and gamma.

A tiny, efficient radiation indicator, the dosimeter, was developed to indicate the presence of X-rays or gamma radiation when the chloroform and purple dye it contains changes color to yellow.

Construction was started on a plant to "breed" fissionable plutonium from non-fissionable uranium.

An invisible dust of sand coated with radioactive poisons collected from the waste of



REACTOR CORE—Top of the reactor core of the Argonne National Laboratory's heavy water reactor. The shield has been removed to show the ends of uranium rods which are suspended in a tank of heavy water. Materials to be made radioactive are lowered into the hole in the center.

PROTECTION—The special visor on this crash helmet insures that the helmet will stay on a flier's head even during high speed bailouts, protecting him from concussion. When not in use, it can be pushed up out of the way.

atomic furnaces was cited as a possible mystery weapon, which could wipe out the population of large cities.

A process was developed for grinding tough materials by using liquid nitrogen to cool them to a point of maximum fragility.

The world's first neutron-absorbing glass, giving transparent protection for eyes against atomic damage, was made from cadmium borosilicates with fluorides, while glasses containing tungsten phosphate were made for protection against X-rays.

The action of catalysts was explained as due to electrical fields inside the atoms, which pull and distort the shape of atoms near the surface and so make them act in an unusual way.

A joint report released by the Atomic Energy Commission and Department of Defense was the most complete technical description made public on what happens when the atomic energy is released as a weapon.

A camera was designed to take pictures of shock and detonation waves in explosions; it can produce 100,000,000 frames a second.

A chemical wedding between the element boron and organic substances promised industry a new family of compounds that may rival the new silicone plastics, lubricants and waterproofing substances.

The first metallic element that shrinks instead of expanding when heated was made available as a by-product of the atomic bomb—radioactive polonium.

Crystals of mica, bigger and better than natural crystals, were created synthetically.

The amount of energy necessary to remove an atom from the germanium lattice was determined by electron bombardment.

The P-N boundary in germanium was shown to function as a crystal counter.

Two German chemists, Drs. Otto Diels and Kurt Alder, won the 1950 Nobel Prize in chemistry for their discovery of the widely used synthesis method bearing their name.

Nobel Prize in physics this year was won by Dr. Cecil F. Powell of Bristol University for his research on mesons and his development of methods to photograph these subatomic particles.

EARTH SCIENCES

Long Range Predictions Issued Twice Monthly

Beginning in February, the U. S. Weather Bureau issued for newspaper use twice monthly 30-day predictions; in the first three months these were 79% correct.

Large-scale practical application of theory of rainmaking was made in New York in an effort to relieve water shortage there. Results are still being studied. Disagreement about rainmaking, based on uncertainty over number and efficiency of natural nuclei in atmosphere, continued.

A mechanism for the generation of thunderstorm electricity involving collision of ice crystals formed by sublimation colliding with super-cooled water droplets was proposed.

Specially designed radar sets with ranges of 200 to 250 miles, working in pairs, aided in tracking storms and hurricanes.

New types of atmospheric nuclei originating rain drops were identified with the electron microscope; these included minute crystals of sea salt, magnesium chloride particles and silica dusts so fine they cannot be seen with ordinary microscopes.

Mauna Loa erupted, spreading a haze over 3,500,000 square miles of the Pacific Ocean.

A squall line was interpreted as a "pressure jump line" (small but sharp barometric pressure rise occurring along a line) propagated as a gravitational wave along the temperature inversion in a stratified atmosphere. The zone of interaction of two intersecting pressure jump lines was suggested as a preferred zone for tornado formation.

Thorium occurs in the monazite sands of the Gaya district and other parts of India, it was reported.

Large quantities of jet engine fuel can be extracted from the oil shales of Colorado, it was announced.

Major deposits of phosphates, possible source of uranium, were found on the floor of the Gulf of Mexico off the Florida coast.

Deposits were found of rare earth elements suitable for use in tracer bullets and cigarette lighters.

There were 150 earthquakes of sufficient strength to record themselves on seismographs so that they could be immediately located; these included an extremely destructive one in Cuzco, Peru, another in Colombia, one in China, and one of the greatest earthquakes in history in Assam.

A laboratory completed at the University of California at Los Angeles is equipped with machines capable of exerting pressures equivalent to those 22 miles below the earth's surface for studying earthquake causes.

The Pacific Coast, 50,000,000 years ago, was tropical as far north as Puget Sound, study of marine fossils indicated.

The most disastrous flood in Canada's history caused great damage at Winnipeg.

Evidence that a glacier, larger than any other known, descended both east and west slopes of the Sierra Nevada mountains about a million years ago was discovered.

A new mountain range was discovered, the top of which is 2,700 feet below the surface of the Pacific ocean.

A possible clue to the evolutionary "missing link" was found in an apeman's thumb bone showing that the thumb, while shorter than man's, was useful for clasping.

Jawbones of triconodonts were found in Early Cretaceous sands of northern Texas, the earliest of such mammal remains ever discovered there.

ENGINEERING-TECHNOLOGY

Single Wire Promising To Supplement Coaxial Cable

A single wire with a special insulation and funnel-shaped terminals may supplement the coaxial cable as a low-cost telephone and television transmission line, it was announced.

America's first coal-burning gas turbine locomotive was constructed.

A new raw material for synthetic rubber, para alpha dimethyl styrene, was obtained from spruce paper manufacture waste.

A water-cooled periscope was used to examine the inner parts of the flaming gases in the exhaust of a jet engine.

A new type of photoelectric cell, called a phototransistor, was made with a tiny disk of germanium as a heart.

The first completely self-contained and completely mobile underwater motion picture camera was developed.

By covering ceiling, walls and floor of a room with heat-reflecting aluminum foil, it was found possible to keep the occupants of the room comfortable with only minor conventional heating or air-conditioning apparatus.

Direct sunlight supplied 75% of the heat needed to keep an occupied experimental solar-house in Massachusetts comfortable during the past winter.

A lightweight Diesel engine was developed and used in a racing automobile.

A metal electronic tube rectifier for converting AC from feed lines to DC for driving motors opened the way for widespread electrification of railroads.

New development of the magnetic-fluid clutch utilized two cylinders able to rotate independently on same axis with magnetic fluid between.

An electrical insulation tape made from glass fibers and silicone rubber, resilient at high temperatures, was developed for use in motors of electric locomotives.

Making engine parts radioactive by use of the atomic pile, made it possible to measure engine wear by measuring radioactive iron particles in the oil after a test run.

Gas turbine engines for highway freight hauling were experimentally tested.

New form of carbon, hard enough to scratch glass and with high thermal conductivity, was developed.

Tartaric acid, ingredient of baking powder, was made synthetically from benzol and hydrogen peroxide, replacing the natural product from French wine industry.

Silicone rubbers developed for high temperature uses were found suitable for use at temperatures as extremely low as 148 degrees below zero Fahrenheit.

A mobile carbon dioxide generator was de-

veloped to produce the fire-fighting gas in large quantities for military use.

"BEMAC", new giant electronic computing machine, calculated every movement that a giant missile would make in flight and made a motion picture record of its imaginary flight, before the missile was fired.

An improved 400-digit memory tube was developed for use in electronic calculators.

A new device, developed as an attachment for electronic computers, enabled them to detect errors and record them, correct them and proceed to the right answer.

A radio transmitter-receiver, tiny enough to hold in one hand and powered with a miniature battery, was developed and put into production for use by downed airplane pilots in lifeboats or lifebelts.

A machine was designed to record 14 two-way conversations on a single magnetic paper tape at the same time for use in airplane traffic control.

A device was developed for use on a radio receiver to stop its operation for a minute or so at the sound of a hand clap or a yell "shut up."

A method for transmitting a single sideband instead of the two which now blend into a single perfect signal in present receivers, neared perfection and promised to double the number of available radio channels.

A color filter using three films of vacuum-applied silver and magnesium fluoride, having applications in color photography and color television, was reported.

A small-size television pick-up tube, the "vidicon," was developed; it employs photoconduction, the property of a poor conductor of electricity in darkness of becoming a good conductor when exposed to light.

A cut in both cost and size of television receivers was made possible by use of prefabrication and printed circuits.

Mirrors that reflect one color only, the color depending on the thickness of a deposited metallic layer, were developed for use in color television.

Permission was given to the Columbia Broadcasting System to start color television broadcasting.

A hot-spray process for applying paint, varnish and lacquer was perfected; the heat replaces a large part of the solvents, improving coverage and shortening drying time.

A new method for processing color photographic film in only 20 minutes and making prints in 15 minutes was developed.

Addition of scrap iron and limonite to concrete gives better protection from atomic radiation, it was found.

A new ceramic that can be cut, threaded, shaped or turned on a lathe was produced.

A new alloy of copper and beryllium added to zinc was developed; it has the same strength and electrical characteristics as brass.

Molds for cast metal machine parts were made from sand bonded with phenolic resin, eliminating the necessity for smoothing off rough surfaces caused by the sand grains.

A turbo-hearth process for making steel was announced which is capable of making open hearth quality steel in 12 minutes without the use of external fuel.

A new stainless steel of chromium, nickel and copper was developed, having excellent corrosion resistance, high strength and hardness, ease of fabrication anl low-temperature hardenability.

A synthetic rubber, made from butadiene and styrene by a process employing a sodium catalyst, is suitable for use in the body of automobile tires.

A method was developed for the quick hardening of sand and mud to make a surface suitable for military trucks and airplanes by use of three inexpensive chemicals.

A filter was made from treated paper-making fibers mixed with asbestos to remove fine radioactive particles from gaseous wastes from nuclear processes and to filter smoke stack gases to prevent smog.

MEDICAL SCIENCES

Cortisone and ACTH Aid in Battle Against Diseases

Cortisone and ACTH, adrenal and pituitary gland hormones respectively, were reported effective or promising in the following conditions besides arthritis: rheumatic fever, lupus erythematosus, leukemias, lymphosarcomas, Hodgkin's disease, severe burns, periarteritis nodosa and cranial arteritis, eye inflammations, asthma, and, for ACTH, a means of predicting the patient's chances of surviving surgery.

Cortisone and an anti-folic acid chemical used in relays were reported promising in control of leukemia.

Cortisone was made available to physicians as well as hospitals through regular drug channels.

An improved method of synthesizing cortisone, eliminating the need for rare osmium, was announced, with prediction of larger supplies resulting.

The step-by-step processes by which cortisone and allied steroid chemicals are synthesized from their parent chemicals by the adrenal glands were discovered through perfusion studies, giving new insight into adrenal physiology and chemistry and suggesting an industrially important method of obtaining high yields of some steroids related to cortisone from cheap parent chemicals.

A new compound obtained from ACTH was reported to give as good results in arthritis treatment as ACTH and cortisone with the added advantage of being potentially synthesizable.

Pregnenolone, cheap synthetic steroid chemical, was reported to have anti-arthritic effect when taken in large amounts due to its conversion by the adrenal glands in part to cortisone and allied steroids.

Increased supplies of ACTH were predicted from a method devised for getting it from cattle pituitary glands and from a new method of extracting it from hog pituitaries.

Atropine was announced as a remedy for the so-called nerve gases, war gases related to some of the newer insecticides.

Defective giant molecules, fatty in nature, were discovered in the blood of patients with the artery disease, atherosclerosis, and implicated as the cause of the condition with a low-cholesterol diet suggested for controlling the condition.

Promacetin, new sulfone chemical related to promin, diasone and sulfetrone, was announced as a promising remedy for leprosy.

New, potentially life-saving remedy for infant diarrhea was found in the element, potassium.

A mobile blood processing unit which through new technics can separate red cells, white cells, platelets and essential plasma fractions within six hours after blood is drawn was produced to speed effective utilization of blood.

The first artificial heart which pumps untreated blood from a real heart through a kidney or other organ and back to the real heart was devised.

An operation creating a bladder and outlet from part of the large intestine was devised for patients after operation for cancer of the bladder or other bladder diseases.

A cheap chemical used as a boiler scaler, the tetra sodium salt of ethylene diamine tetra acetic acid, was announced as a remedy for dissolving kidney and bladder stones.

Fibrinogen and thrombin, clotting chemicals from the blood, were used to remove kidney stones without surgical operation.

The youngest fertilized human egg yet observed, a morula aged 60 hours, was reported.

Discovery of a new epidemic disease, Influenza C, was announced.

Snipping a small diamond-shaped piece from the tissue leading from the stomach to the small intestines was devised as a less radical operation for ulcer patients.

A stomach hormone, gastrin, produced by the antrum, or lower part of the stomach, was discovered and reported as possibly playing a part in causing ulcers.

A quaternary ammonium compound, Banthine, was reported effective as a remedy for stomach ulcers and for a condition of excessive sweating.

The attack on schistosomiasis, world's number three health problem, moved forward with success in field trials of two anti-snail chemicals, sodium and copper pentachlorophenates.

Change in season for giving immunizing "shots" against diphtheria and whooping cough was suggested following reports that children were more susceptible to poliomyelitis immediately after these immunizations.

An anti-poliomyelitis substance was discovered in human breast milk.

Poliomyelitis virus was grown for the first time in non-nerve tissue outside the body.

Classification of three distinct types of poliomyelitis virus and continued search for possible other types was announced.

An anti-mumps vaccine became available

FIRST BABY PICTURE—Human fertilized egg photographed only 60 hours after fertilization, the youngest yet seen. It was reported by Drs. Arthur T. Hertig and John Rock of Harvard and the Carnegie Institution.

POWERFUL — This 2,000,000-volt X-ray machine for treatment is one of the largest of its kind ever built. It was recently dedicated at the Hospital for Joint Diseases, New York.

commercially for the first time.

A new B vitamin capable of reversing the toxicity for mice of an antifolic acid chemical used in treatment of leukemia was isolated and synthesized.

The white blood cell count was reported the best indicator that a person had absorbed a potentially dangerous dose of radiation.

First evidence of delayed effects of the atom bombs came from discovery of about 40 cases of cataract and an additional 40 suspected cases among survivors.

Lying down and keeping quiet, and the drugs, aureomycin, streptomycin and thiourea, were suggested as methods of countering radiation effects from atomic bombs.

Immediate penicillin treatment of streptococcic disease was suggested as a means of preventing rheumatic fever.

Lumpy jaw, acute nonspecific pericarditis, glandular fever, pemphigus, canker sores, and gas gangrene were added to the list of diseases that may be remedied by aureomycin.

Terramycin, new antibiotic drug active against whooping cough, pneumonias, gas gangrene infections, post-irradiation infections, urinary tract infections, scrub typhus, Q fever, Rocky Mountain spotted fever, rickettsialpox, amebiasis, and possibly influenza was announced.

Chloromycetin was found capable of preventing as well as curing scrub typhus.

Bacitracin was reported an effective remedy for amebic colitis.

Discovery of a new streptomycin, hydroxystreptomycin was announced.

New anti-tuberculosis chemicals undergoing trial were Tibione, a German drug, and a benzoic acid preparation called Benemid.

The Rh blood factor is linked with congenital deafness, it was announced.

A jelly-like chemical, acid mucopolysaccharide, was found to be a constituent of the dentine and enamel of normal teeth and its disappearance was reported the first step in decay.

Penicillin tooth powder, believed effective against tooth decay, went on the market.

Controversy over the anti-histamines as remedies for the common cold continued, with the anti-antihistamine side apparently winning.

Somnoform, 25-year-old inhalant anesthetic used in dentistry, was reported best "truth serum" so far investigated.

An anti-histamine chemical with the tradename diphenylpyraline was reported swiftly effective for relief of athlete's foot.

A polyphosphate was reported as an antidote for uranium poisoning.

Drinking salt water and soda was recommended as immediate emergency treatment for shock in case of large-scale disasters where blood and plasma might not be available.

Infusion of female sex hormones into veins or under skin for periods of hours was reported effective in relieving male and female patients with far-advanced cancers.

Statistical studies showing a causal relation between smoking and lung cancer were reported.

A new drug, R48, was reported successful in some cases of hitherto incurable cancers of lymph glands, bone marrow and other blood-forming tissues.

Radioactive cobalt was tried for cancer treatment.

Sex hormones may make radioactive phosphorus 15 to 20 times more effective in treating cancer, it was reported.

SK 1133 and Sk 1424, synthetic chemicals, were reported effective anti-cancer agents in laboratory animals.

A new drug for certain kinds of thyroid disease, 25 times as powerful as present antithyroid drugs, was discovered in 1-methyl-2-mercaptoimidazole or tapazol for short.

Acetylmethadol was reported as highly effective in reducing withdrawal symptoms when morphine was withheld from addicts.

Withdrawal of barbiturates from addicts with chronic barbiturate intoxication was found to cause temporary psychosis and other serious mental and physical reactions.

BAL, or British antilewisite, was reported successful as a treatment for lead poisoning.

A new, non-sugar sweetening agent, sucaryl, was discovered.

A new drug of the benzathiazole class, tradenamed Asterol, was reported effective in ringworm of the scalp, athlete's foot and other fungus infections.

The digestive enzyme, trypsin, was found effective clearing up empyema from tuberculosis or other infections.

A new operation, denervation of the pelvic colon, was reported helpful in treating ulcerative colitis.

Methods were devised for determining the body fat and body water content of living human beings by specific gravity and blood plasma concentrations of antipyrine.

The Holger-Nielsen and the Eve methods for artificial respiration were shown to be superior to the Shafer method.

Acclimatization to severe work and heat stress results in a reduction of salt loss in the sweat.

The Nobel Prize in Medicine was awarded to Drs. Edward C. Kendall and Philip S. Hench of the Mayo Clinic and Dr. T. Reichstein of the University of Basle, Switzerland, for researches on the adrenal gland which led to development of cortisone.

PSYCHOLOGY-PSYCHIATRY

Find Seven Temperament Factors Can Be Measured

There are seven measurable factors of temperament, it was found: impulsiveness, pressure for activity, masculinity, dominance, emotional stability, sociability and reflectiveness.

Conflict among dominant members of a group does not necessarily result in combat between them; more often they take it out on a timid, submissive member, experiments with dogs demonstrated.

Individuals that learn to fight for food when young, will still squabble over food when adult even though not hungry then, experiments with mice revealed.

A method was reported for measuring shimmer due to small scale convection currents that cause air masses of different optical density to cross the line of sight, thus lessening apparent contrast of a dark object against a bright sky and interfering with its visibility.

The length of the dark periods between flashes of light necessary to see the light as flickering and not continuous was found to be determined by the central nervous system and not by the eyes; the flicker frequency is related to intelligence.

Blind adults of average intelligence can learn to understand the electronic reader that scans a printed page and translate the type into patterns of sound, it was found; speed was 36 words a minute.

(Turn to page 412)

ENCYCLOPEDIA OF SUBSTITUTES AND SYNTHETICS

Edited by Morris D. Schoengold

with the Collaboration of America's Foremost Chemical and Industrial Laboratories

"To the chemist this encyclopedia of raw materials, chemicals, processes, subtitutes and synthetics, will prove extremely useful. . . . This, the first compendium of its kind, shows that 'substitutes' often are superior to the materials replaced."

—*Scientific Monthly*

$10

ORDER COUPON

PHILOSOPHICAL LIBRARY, Publishers
15 East 40th St. Desk 35, N. Y. 16, N. Y.

Send ------- copies ENCYCLOPEDIA OF SUBSTITUTES AND SYNTHETICS at $10 each.

Name ----------

Address ----------

Expedite shipment and save postal charges by prepayment

GENERAL SCIENCE

Wants Service for All

Conant and Bush urge putting all 18-year-old boys in uniform for two years of service. Gap in flow of trained men would not be serious, they believe.

➤ OPENING gun in the battle over what to do with a million 18-year-old boys every year has been fired by President James B. Conant of Harvard, wartime science mobilization chief Vannevar Bush and former Undersecretary of Army Tracy Voorhees. They ask that all 18-year-olds be put in uniform for two years of service.

Occasion for making the proposal was a press conference to announce the formation of a "Committee on the Present Danger," composed of college presidents, former government officials, elder statesmen and at least one prominent playwright.

The question will eventually have to be decided by President Truman and the Congress.

Essential differences in the two approaches to the problem of providing the nation with adequate military forces are:

General Lewis B. Hershey's educator and scientist advisers contend that the armed forces need a continuous flow of trained scientists, technicians and engineers coming out of college. They say putting all 18-year-old men in uniform for two years would, later on, cut off this continuous flow for two years.

At the press conference, Drs. Conant and Bush said their plan would take young men before they had begun either college or productive life and that the gap in the continuous flow of trained men would be neither as serious nor as clear-cut as it might seem.

General Hershey's plan would provide deferment for all kinds of college training to those qualified. They contend that no one can now tell what will be "essential" training five or ten years from now. Who, before the last war, would have said that proficiency in the Korean language or in nuclear physics would turn out to be essential?

Dr. Conant conceded that there should be some "flexibility" about the two years of service. The military, he said, might send some of the men to college before their two years were up. Dr. Bush pointed out that many of the men would receive technical training in the Armed Forces.

Science News Letter, December 23, 1950

GENERAL SCIENCE

Opposes Service Plan

President Cavanaugh of Notre Dame holds some plan must be made to provide opportunity for training in college.

➤ FATHER John J. Cavanaugh, president of Notre Dame University, took issue with President James B. Conant of Harvard and Dr. Vannevar Bush, World War II science mobilizer, over their proposal for Universal Military Service.

"The experiences of World War II have proved the need, not only in time of war, but in the vital post-war period, of men trained in colleges and universities," Father Cavanaugh told Science Service. "Some plan, such as that endorsed by General Hershey, must be made for war emergency, to provide the opportunity for training on the undergraduate and graduate level."

Selective Service Director Lewis B. Hershey's plan calls for deferment of qualified high school graduates to go to college.

"I appreciate the concern of Dr. Bush and Dr. Conant over the present situation in which this country finds itself," Father Cavanaugh continued. "Maybe they, with better knowledge, see a greater urgency in that situation than I do.

"On the other hand, the present emergency may be of long duration. To meet the situation, a nation may not safely adopt a short-range policy. America is strong today, not chiefly by reason of the number of its men, but by reason of its wealth of trained manpower, of men capable of carrying on, not only the technological progress of the nation, but the moral and cultural progress as well."

Both Drs. Bush and Conant stressed the need for maintaining technological superiority over the communist part of the world. They did not believe, they said, that two years of military service at age 18 would seriously interrupt the flow of scientists, technicians and engineers trained to maintain that technological superiority.

Continued Father Cavanaugh: "I hardly think we wish to imitate the nations of Europe in the experience they have had with Universal Military Service.

Science News Letter, December 23, 1950

From Page 411

When magnetic tape recordings were cut and spliced it was found that it is possible to understand speech at a rate twice as fast as it is ordinarily spoken, thus saving transmission time.

Experimental evidence was found that the feeling of pressure is a mental concept, not a direct sensation and the mechanism located in the brain, not at the periphery of the body.

Normal individuals have an increased acuity in their sense of taste for sugar before meals and a decreased acuity after meals, it was found.

Teaching sculpture to blind persons was found to aid them in improving their orientation.

Exposure to oxygen lack equivalent to 30,000 feet altitude causes a loss of learning ability and re-learning ability, it was found through experiments with rats.

Pigeons were taught to cooperate in work and to compete in a ping-pong game, as well as to pick out tunes on a piano; they were found to be better laboratory animals for certain purposes than rats.

Two "natural enemies", alley cats and rats, were taught to work together cooperatively to get food, to eat, play, and live together in harmony.

A chimpanzee, adopted into a human family and raised from a few days after birth as a child, developed in a way closely parallel to that of a human child except for her speech, it was reported; she learned to speak three words and use them correctly, but only with great difficulty.

The group atmosphere of United Nations meetings is not conducive to thoughtful consideration of the merits of proposals, analysis of the official summaries of debates revealed.

A "lie detector" was used in combination with a very sensitive photo-electric recorder to spot the emotional abnormality often associated with juvenile delinquency; it reveals lack of emotional response to situations that commonly rouse emotions.

Radioactive phosphorus was successfully used in conjunction with a miniature Geiger counter probe to determine the extent of brain tumors.

The first case of a mental patient who choked himself to death by biting his tongue and holding his breath was reported.

A mental patient was saved from death after his temperature had gone up to 106 degrees in a state of acute excitement.

Mental patients who direct their aggression against themselves have a better chance of later recovery than those who attack others, analysis of accident and injury reports revealed.

Suggestions made under hypnosis were found to be effective two months later.

The depth of trance in a hypnotized person was measured by placing electrodes on the forehead and either hand of the individual and measuring voltage changes of the body.

Normal persons were found to be better liars than neurotics when under the influence of hypnotic drugs, or "truth serums."

Hypnotism was used to distinguish epileptics from other persons with seizures due to a psychoneurotic condition; the psychoneurotics could recall, under hypnotism, every detail of their surroundings during seizures.

The big-boned, muscular type of person has a much better chance of getting over serious mental disease, if he develops it, than those with low muscular development, study of over 1,000 consecutive patients showed.

Science News Letter, December 23, 1950

ASTRONOMY

Study Interstellar Glow

Faint glow of tenuous material between the stars can be observed only with fast spectrographs. It is only one-tenth as bright as earth's upper atmosphere.

➤ LIGHT from the tenuous material between the stars is being closely examined these days. Study of this faint material may give astronomers a clue to the number of extremely hot stars in different types of galaxies.

This interstellar glow is ten times fainter than the glow of the earth's upper atmosphere, noticeable on a dark night, reports Dr. Thornton Page of the University of Chicago's Yerkes Observatory.

Both in our own Milky Way galaxy, and in other clusters of stars and nebulae, the faint glow of interstellar gas can be studied only with fast spectrographs. Even with the best equipment, four to eight hours, and even longer, may be needed to trap the faint light on photographic plates.

The tenuous material between the stars can be detected in several ways:

1. Denser clouds show up as nebulae on astronomical photographs.

2. and 3. Distant stars seen through a large amount of interstellar material are reddened, and their spectra show absorption lines of interstellar gas.

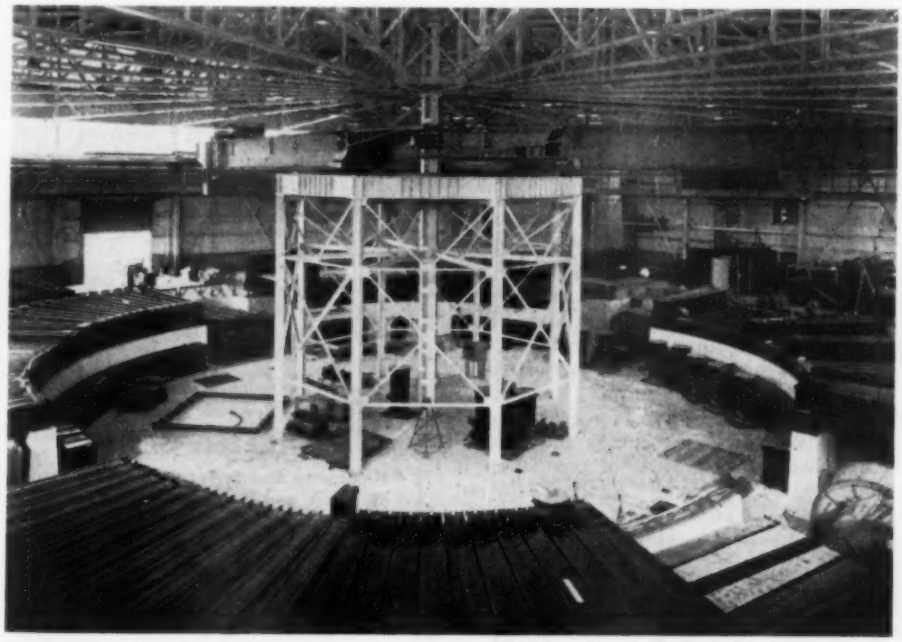
4. Apparently dark parts of the sky between stars glow with a faint light whose spectrum shows emission lines of hydrogen, oxygen, nitrogen and other gases.

The intensity of interstellar glow varies markedly from one galaxy to another. It is particularly strong in galaxies which contain many hot, blue stars, Dr. Page has found. This light may even reach a maximum of over 10% of all the visible light.

This glow is evidently produced by fluorescence in the interstellar gas from the strong and otherwise unobservable, far-ultraviolet light of hot stars, Dr. Page states. Reversing this reasoning, he hopes to find from intensity measurements with his fast spectrograph how many hot stars there are in different types of galaxies.

For the past two years Dr. Page has been using a spectrograph with a Schmidt camera attached to the 82-inch telescope of the University of Texas' McDonald Observatory to study this faint light. The Research Corporation recently made a grant to enable him to purchase a brighter grating for his spectrograph so he can study nebulae which are farther away and only half as bright as those now being scrutinized.

Science News Letter, December 23, 1950



GIANT—This six-billion-electron-volt bevatron, being built with Atomic Energy Commission funds at the University of California radiation laboratory, will guide protons in a precise path over a distance greater than that from the earth to the moon.

ATOMIC BOMBING

How To Protect Yourself

by

SCIENCE SERVICE

An atomic attack on this country is a distinct possibility. In this authoritative, non-sensational volume, Science Service provides instruction on how to protect yourself and others before, during, and after such an attack.

The book has 192 "What-to-do" pages — nineteen chapters—including:

WHAT AN A-BOMB WILL DO

WHAT YOU CAN DO

ORGANIZING AGAINST ATTACK

A-BOMB RADIATION

HOW TO DETECT RADIATION

MEDICAL FIRST AID

TREATMENT OF BURNS

HISTORY OF ATOMIC ENERGY

Price only $1.95

To: SCIENCE SERVICE
1719 N Street, N. W.,
Washington 6, D. C.

I enclose $_____

Send me_____copies of
ATOMIC BOMBING

Name_____

Address_____

City_____

State_____

GENERAL SCIENCE

Ten Top Science Advances

➤ THE TEN most important science advances during 1950 as picked by Watson Davis, director of Science Service, are:

1. Beginning of intensive development of the "hydrogen" super-bomb.
2. Dating of archaeological objects up to 25,000 years old by radiocarbon atomic "calendar" with consequent re-dating to about 10,000 years ago the last Ice Age and arrival of man in America.
3. Inauguration of weather forecasts for 30 days ahead by U. S. Weather Bureau, issued twice a month.
4. Decision by FCC authorizing commercial broadcasting of color television.
5. Measurement of seven factors of temperament: impulsiveness, pressure for activity, masculinity, dominance, emotional stability, sociability and reflectiveness.
6. Development of new blood processing method that separates red cells, white cells, platelets and essential plasma fractions within six hours.
7. Two new elements number 97 and 98 created by atomic bombardment and named berkelium and californium.
8. Discovery that Proxima Centauri, star nearest solar system, has frequent and gigantic flare-ups.
9. Discoveries of large meteor crater in Quebec and lofty mountain range on floor of Pacific.
10. Continued successful use of cortisone and ACTH in rheumatic diseases and extension of use to burns, malignant conditions and inflammatory diseases of eyes and blood vessels.

Science News Letter, December 23, 1950

GENETICS

Fears Global Chaos

Geneticist feels that disaster may come before man learns to harness solar energy for food production or stabilize population growth.

➤ THE GREATEST danger of this century is that global chaos will prevail before man has succeeded either in harnessing solar energy for new methods of food production or in stabilizing his own reproductive rate, Dr. Paul C. Mangelsdorf, Harvard University geneticist, told the American Academy of Arts and Sciences meeting in Boston.

Development of hybrid corn, in Dr. Mangelsdorf's opinion, has been one of the most important factors in saving American culture and European civilization during World War II and afterwards. During the war food production in the United States was stepped up 20% when desperately needed, largely because of the increased production of corn. Since the war, our corn surplus due to hybrid corn made it possible for America to ship to western Europe enough food of various sorts to stem the rising tide of communism there.

"Perhaps Russian antipathy to Mendel's laws of heredity on which hybrid corn development is based is not unfounded," Dr. Mangelsdorf said.

It is difficult for Americans, he said, to realize that two-thirds of the world's people are inadequately fed and suffering from chronic malnutrition, while Americans live in a land of agricultural surpluses and taxed to maintain scarcity prices in the face of plenty.

Yet the world's population is increasing at the unprecedented rate of 22 million people per year and this rate promises to accelerate still further before it begins to decline.

Dr. Mangelsdorf does not agree with those who believe the United States alone can feed the world, continuing indefinitely to produce and export food surpluses. This would be a short-time palliative and exporting food is shipping abroad a part of America's permanent soil fertility.

Learning to utilize solar energy to continue a flow of luxury energy and controlling unrestricted growth of population is suggested by Dr. Mangelsdorf as a way out of the disaster facing the world.

Science News Letter, December 23, 1950

GENERAL SCIENCE

Try To Prevent Enlistment of Research Men

➤ THE NAVY and the Atomic Energy Commission are making efforts to prevent the enlistment of young scientists doing research work essential to the national welfare in universities and in industrial and other private laboratories. A growing number of these young men are enlisting or refusing to ask for deferment in order to get away from what they feel is the stigma of not being in uniform.

First step in this effort was a statement signed by Chairman Gordon Dean of the AEC and Undersecretary Daniel A. Kimball of the Navy Department which appears in the magazine SCIENCE (Dec. 15). The statement is designed to bring home to the young scientists the importance to defense of their work as civilians. It reads:

"One very essential condition for maintaining our national strength, whether for peace or for war, is that the research in the sciences which is basic to all technological progress be kept at a high level . . . The scientist in his laboratory and the research professor with his graduate students are performing a service which may make a critical difference to our country in the difficult years ahead. In particular, the Department of the Navy and the Atomic Energy Commission consider a high level of basic research in the sciences essential to the continued progress of their respective programs."

Science News Letter, December 23, 1950

MEDICINE

Itching Skin Relieved by Bromine and Calcium

➤ THE ITCHING, weeping symptoms of some skin diseases can be relieved by a compound of calcium and bromine, Dr. William Parker of St. Louis reported. (JOURNAL, MISSOURI STATE MEDICAL ASSOCIATION.)

The sedative effect of the bromine ion has long been known. Dr. Parker believes it is soothing in skin trouble because the skin and the brain and central nervous system are related on an embryologic basis. The calcium in the combination he uses acts as an anti-inflammatory agent by decreasing permeability of the cells. This counteracts or stops the weeping so troublesome in some skin disorders.

Calcium bromide-galactogluconate, with the trade name of Calcibronat, is the compound he uses. It is sold only on prescription.

Science News Letter, December 23, 1950

INDEX OF REFRACTION LIQUIDS

For Identification of Minerals & other Solids by the Immersion Method of Microscopy
Range 1.400-1.700, intervals of 0.002 or as selected. Index certified to 0.0002
Range 1.71-1.83, intervals of 0.01
Write for Price List Nd-SNL

DENSITY LIQUIDS

For identification of minerals, gems and other substances by the sink-and-float method. New suspensions extend the working range up to density of 7.
Write for leaflet D-SNL

R. P. CARGILLE
118 Liberty Street New York 6, N. Y.

"FACETED GEMS"

Six Crystal Quartz Family Gems, a piece of rough and a faceted stone of each (12 pieces) in Snowfoam Plastic Mount 3 x 5 x ½" containing Amethyst, Smoky Quartz, Citrine, Clear Quartz, Rose Quartz and Green Quartz. $9.75 prepaid. Booklet, Introduction to Geology for the Layman, 50¢.

Write for free catalogue

ECKERT Mineral Research Naturegraph Co.
Dept. SNL
110 E. Main St. Florence, Colorado

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

AMERICAN GLASS—Valentine Van Tassel—*Barrows,* 191 p., illus., $2.00. A brief history of one of America's first industries. Well illustrated.

AMERICAN LITHOGRAPHS OF THE NINETEENTH CENTURY—Helen Comstock—*Barrows,* 170 p., illus., $2.00. A brief history. Many famous lithographs are reproduced in black and white.

CHEMICAL PROBLEMS OF THE AUTOMOBILE INDUSTRY—C. L. McCuen—*General Motors Research Laboratories Division,* 17 p., illus., paper, free upon request to publisher, 3044 West Grand Blvd., Detroit 2, Mich.

THE CHEWING GUM TREES—Ruth Bishop Juline—*Lothrop, Lee & Shepard,* 122 p., illus., $2.50. The story of a Chiclero and his adventures in obtaining sap for chewing gum. For ages 8-12.

CHYMIA: Annual Studies in the History of Chemistry, Vol. III—Henry M. Leicester, Ed.-in-chief—*University of Pennsylvania Press,* 251 p., illus., $4.50.

COFFERDAMS—Lazarus White and Edmund Astley Prentis—*Columbia University Press,* 2nd ed., 311 p., illus., $10.00. Presentation of theoretical considerations of hydrodynamics of seepage forces, stream erosion and lateral earth pressures for cofferdams.

EMPLOYMENT OUTLOOK IN PETROLEUM PRODUCTION AND REFINING—Bureau of Labor Statistics—*Gov't. Printing Office,* U. S. Dept. of Labor Bull. No. 994, 52 p., illus., paper, 30 cents.

ENCYCLOPEDIA OF THE EYE: Diagnosis and Treatment—Conrad Berens and Edward Siegel—*Lippincott,* 272 p., illus., $5.00. A reference book for the general practitioner.

FLUORINE CHEMISTRY, Vol. I—J. H. Simons, Ed.—*Academic Press,* 615 p., illus., $12.00. A reference book written on many aspects of fluorine chemistry by well known authorities such as Anton B. Burg, Donald Ray Martin and W. A. Weyl.

HIGHER EDUCATION IN THE NATIONAL SERVICE—Francis J. Brown—*American Council on Education,* 151 p., paper, $1.50. A report of a national conference held in Washington, D. C., Oct. 6-7, 1950.

JOURNAL OF ATMOSPHERIC AND TERRESTRIAL PHYSICS, Vol. I, No. 1—Edward Appleton, Editor-in-Chief — *Butterworth-Springer* (U. S. Distributor: Academic Press), 64 p., illus., paper, $9.50 per volume. A new journal.

MANUAL OF BASIC TRAINING, Vol. II: Atomic Warfare—Home Office Civil Defense—*His Majesty's Stationery Office,* (U. S. Distributor: British Information Services), 60 p., illus., paper, 50 cents. A short manual of practical information.

A MANUAL OF PLASTICS AND RESINS: In Encyclopedia Form—William Schack, Ed.—*Chemical Publishing Co.,* 547 p., illus., $10.00. A survey of the materials, processes, products and equipment of the plastics industry.

METHODOLOGY AND TECHNIQUES FOR THE STUDY OF ANIMAL SOCIETIES—J. P. Scott, Consulting Ed.—*New York Academy of Sciences,* 119 p., illus., paper, $2.50. Result of a conference held on Nov. 12 and 13, 1948.

THE MEXICAN CULTURAL MISSION PROGRAMME Lloyd H. Hughes—*UNESCO,* (U. S. Distributors: Columbia University Press), 77 p., illus., paper, 45 cents. Description of a Mexican experiment in improving rural community life.

NEW BIOLOGY—M. L. Johnson and Michael Abercrombie, Eds.—*Penguin* (U. S. Distributor: Allen Lane), No. 9, 128 p., illus., paper, 35 cents. A collection of short articles for the general reader. Includes text of the recent UNESCO statement on race problems.

1950 BITUMINOUS COAL ANNUAL—*Bituminous Coal Institute,* 200 p., illus., paper, 85 cents. Facts and figures of the industry for the year.

THE PHARMACEUTICAL INDUSTRY IN GERMANY DURING THE PERIOD 1939-1945—J. B. M. Coppock—*His Majesty's Stationery Office* (U. S. Distributor: British Information Services), 120 p., illus., paper, 90 cents.

PHYSICIAN TO THE WORLD: The Life of General William C. Gorgas—John M. Gibson—*Duke University Press,* 315 p., illus., $4.50. The biography of the man who waged a successful war against yellow fever.

RADIOACTIVE TRACERS IN METALLURGICAL RESEARCH—W. S. Eastwood and others—*His Majesty's Stationery Office* (U. S. Distributor: British Information Service), 55 p., illus., paper, 40 cents. Intended to facilitate use of isotopes in British research.

RESEARCHES ON FUNGI, Vol. VII: The Sexual Process in the Uredinales—A. H. Reginald Buller—*University of Toronto Press* (Trade Distributors: S. J. Reginald Saunders), 458 p., illus., $13.50.

RESEARCHES ON THE RADIOTHERAPY OF ORAL CANCER—Constance A. P. Wood and J. W. Boag—*His Majesty's Stationery Office* (U. S. Distributor: British Information Services), 148 p., illus., paper, $2.85.

SCIENCE NEWS—J. L. Crammer, Ed.—*Penguin* (U. S. Distributor: Allen Lane), No. 17, 156 p., illus., paper, 35 cents. Among the articles included are Physics and Metaphysics by Max Born, My Attitude to Quantum Theory by Albert Einstein and Finding Water by Cyril S. Fox. Of British origin.

THE SOCIAL AND BIOLOGICAL CHALLENGE OF OUR AGING POPULATION: Proceedings of the Eastern States Health Education Conference, March 31—April 1, 1949—*Columbia University Press,* 183 p., illus., $2.75.

SOME FAMOUS STARS—W. M. Smart—*Longmans, Green,* 219 p., illus., $2.50. Lectures delivered in the early months of 1949 in the Royal Technical College, Glasgow.

STAMPEDE TO TIMBERLINE: The Ghost Towns and Mining Camps of Colorado—Muriel Sibell Wolle, 544 p., illus., $7.50. A history of 240 of Colorado's mining camps. Many black and white illustrations.

STUDIES IN LEADERSHIP: Leadership and Democratic Action—Alvin W. Gouldner, Ed.—*Harper,* 736 p., illus., $5.00. Specialists on leadership from various social sciences have contributed to this volume.

YEARLY SURGICAL DIGEST—Richard A. Leonardo—*Froben Press,* 293 p., paper, $3.00. A summary of current surgical practice.

Science News Letter, December 23, 1950

ENGINEERING

Nylon Used as Base For Fine Metal Tubes

➤ A NEW use for nylon unrelated to stockings or other familiar articles is reported from Sweden's Research Institute of National Defense. Drawn nylon fibers can be used as a base upon which to deposit electrolytically very fine metal tubes useful in electronics and instruments.

Other materials have been used in this way, but they have been very hard to remove from the inside of the tube, particularly when the walls are thin and of small diameter.

The method of making the small metal tubes was communicated by Dr. Rolf J. E. Gezelius, a Swedish scientist, to the REVIEW OF SCIENTIFIC INSTRUMENTS (October).

Science News Letter, December 23, 1950

For YOU—A QUICK, EASY WAY TO LEARN A LANGUAGE

for • PROFESSIONAL, SCIENTIFIC AND EDUCATIONAL ADVANCEMENT!
• Greater Business Opportunities!
• Doubled Travel Enjoyment!
• Wider Social and Cultural Horizons!

BUSINESS

What do you want to learn . . French, Spanish, Russian, German or the Oriental languages? With a LINGUAPHONE you can learn any one of 29 languages, in just 20 minutes a day!

LINGUAPHONE

WORLD'S STANDARD Conversational Method

TRAVEL

is the natural way to learn a language . . . actually the same way you learned English even before you went to school. You hear people SPEAK in their native tongue. You listen—you learn—you understand! You SPEAK with correct pronunciation, proper tonal inflection. You learn to read and write. It's all amazingly easy!

CULTURAL

In peace or war another language can mean power, promotion, a better job, more pay, greater opportunities and cultural enjoyment to you. When traveling, you'll be able to see and do things the native way. If you're in a profession, a scientist, student or teacher, another language is a valuable asset for greater achievement. You're never too old or too young to learn the LINGUAPHONE way! Right at home, in leisure time, alone or with family and friends, Master:—

EDUCATION

SPANISH FRENCH RUSSIAN GERMAN —any of 29 languages including the Oriental available

LINGUAPHONE INSTITUTE, 31-W Radio City, N.Y. 20
Free book gives fascinating facts about LINGUAPHONE—why it is used by U.N., I.L.O., colleges schools, armed services, and has been the choice of more than one million home study students. Mail Coupon TODAY!

SEND FOR FREE BOOKLET

LINGUAPHONE INSTITUTE
31-W Radio City, N.Y. 20
Send me the FREE Linguaphone book.
I want to learn..... language.
Name .....
Address .....
City .....

• Top Patents of The Year •

If you want the patent number of the inventions described here send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N. St., N. W., Washington, 6, D. C. and ask for Patent Bureau Bulletin 1950.*

Notable and interesting inventions patented during the year include:

Electrically-heated mat to keep doorsteps and walk clear of snow and ice.

Device on panel of pilot's cockpit showing at a glance the thrust of a jet engine while on the ground or in the air.

Free-flying pilotless balloon, that will rise to a certain height and remain floating about at that altitude, designed for carrying weather recording instruments.

Improved method for making ammonium sulfate for fertilizer obtaining the product in a substantially dry and free-flowing form.

Improved automobile polish containing silica and a silicone product.

Cold pressure process for welding such metals as aluminum and copper without the use of hot flames.

Stainless steels in many colors, for interior fixtures and furniture, varying from yellow to purple when chemically treated in a special process.

Windshield for microphones that permits better radio broadcasting from outdoor windy locations.

New type coal-mining machine eliminating drilling, blasting and loading by ordinary methods, doing all in a continuous operation.

Heating equipment for use in applying lacquer, varnish and paint as a hot spray.

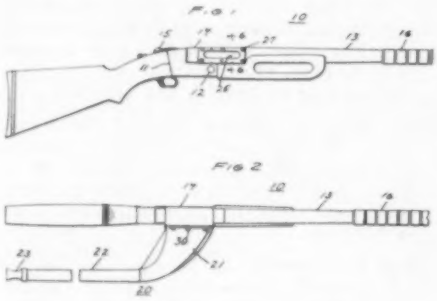
Simple electroplating process that applies protective coatings of chromium-molybdenum alloys on iron, copper and other metals.

Small-size silencer to decrease noise from a low-flying airplane engine.

Improved fluid for use in refrigeration and air-conditioning composed of a mixture of propane and monochlorodi-fluoromethane.

New method of taking X-rays in three dimensions which permits a doctor to see the inside of a patient in actual perspective.

Television camera that can pick up a distant object in total darkness by means of invisible infra-red radiation.



High frequency radio warning device to give the engineer of a speeding train a continuous warning of another train on the track ahead.

Continuous-process machine to convert raw peat into a suitable fuel in compact tubular form for use in American heating installations.

Recoilless gun, a one-man military weapon, that will fire two-pound shell with no greater kick than an ordinary shotgun.

"Workable" stainless steel which can be shaped and fabricated in a relatively soft condition and then hardened by heat-treatment.

Germanium united with nitrogen to form a material which will give off electrical energy when subjected to light or heat.

Continuous-flow paint brush supplied with paint by a paint-holding pressure tank carried on the back with a tube from tank to the end of the paint handle.

An anti-perspirant type of cosmetic based on aluminum methionate.

Automatic carbon dioxide fire extinguisher to lessen danger from film-fires in operating motion picture projectors.

Cross-wind airplane landing gear which permits landing a plane in safety on a single runway field regardless of wind direction.

Method of using germanium and other semiconductors in electrical amplifiers.

Low-cost equipment to clear industrial water contaminated with oil and dirt and permit re-use of the water.

Process for drying green lumber more quickly than by usual methods employing chemical treatment with ammonium carbonate or a mixture of urea with sodium bicarbonate.

Better magnets of the permanent type containing zirconium and titanium in a magnetic alloy to decrease brittleness.

A soybean gel, which contains the protein contents of the bean, as a gelling constituent for foods containing meats or for puddings.

Heat-resistant paint, containing methyl silicone resin, boric acid and a lead compound, designed to withstand temperatures around 1000 degrees Fahrenheit.

Air-cooled spark plug for use in the high temperatures of gas turbine combustion chambers.

Process to freeze eggs, with shells removed, which keeps in all their freshness.

Do You Know?

Indigestion is often caused by eating too rapidly so that food is insufficiently chewed.

Newsprint in India is to be made from a wood known as *selai* that is plentiful in that country.

Pickle liquor, in the steel industry, is a mixture of sulfuric acid and ferrous sulfate that results from a process employed to remove scale and rust in steel manufacture.

Titanium, which may soon become an important structural metal by itself, has been used for at least 50 years as an alloying material in steelmaking.

Heavy rails in railroad tracks are essentials for speed with safety; nearly half those now being produced weigh 120 pounds or more per yard.

ATOMIC BOMB FIRST AID

A series of pertinent, up-to-date articles, published in SCIENCE NEWS LETTER, prepared by Jane Stafford, Science Service Medical Writer, with the cooperation of the American Red Cross and other sources . . . Reprinted in 12-page pamphlet form at reader request. Subjects include:

If Atom Bomb Hits
Check Bleeding First
New Hope for the Burned
Shock and Broken Bones
Aid for Suffocation Victims
Transportation of Injured

15c each

8 for $1.00 100 for $7.50

Please send me_____copies of ATOMIC BOMB FIRST AID @ 15c each, 8 for $1, 100 for $7.50. Mail to my address as imprinted at the right.

$_____enclosed ( ) Bill me

O. K. by initials

SCIENCE SERVICE
1719 N Street N. W. • Washington 6, D. C.

Clip and enclose this address imprint whenever you write us to renew your SCIENCE NEWS LETTER subscription, change address, order other materials, etc. It identifies you as one of the SNL family. Lower line date is expiration. Allow three weeks for address change.

DETROIT PUBLIC LIBR
TECHNOLOGY DEPT
5201 woodward AVE
DETROIT 2 MICH